

## CLAIMS

What is claimed is:

- 1 1. An apparatus for isolating a device from a bus without interrupting system operation,  
2 the apparatus comprising:  
  
3 bus interface logic in communication with the bus, the bus interface logic  
4 generating a signal indicating the status of the bus;  
  
5 an isolation switch in communication with the bus; and  
  
6 isolation control logic in communication with the bus interface logic and the  
7 isolation switch,  
  
8 wherein the isolation control logic transmits an isolation switch control signal  
9 to the isolation switch in response to the generated bus status signal and a  
10 received device isolation signal.
- 1 2. The apparatus of claim 1 wherein the bus interface logic comprises a state machine.
- 1 3. The apparatus of claim 1 wherein the bus interface logic comprises combinatorial  
2 logic.
- 1 4. The apparatus of claim 1 wherein the bus interface logic monitors all bus transactions.
- 1 5. The apparatus of claim 1 wherein the bus status signal generated by the bus interface  
2 logic indicates that the bus is idle.
- 1 6. The apparatus of claim 1 wherein the isolation control logic comprises combinatorial  
2 logic.
- 1 7. The apparatus of claim 1 wherein the isolation control logic receives the device  
2 isolation signal from logic monitoring the operational status of the system.
- 1 8. The apparatus of claim 1 wherein the isolation control logic receives the device  
2 isolation signal from a hot-plug logic element.

- 1 9. The apparatus of claim 8 wherein the hot-plug logic element generates the device  
2 isolation signal responsive to the physical removal of the device from its slot.
- 1 10. The apparatus of claim 1 wherein the isolation control logic receives the device  
2 isolation signal from protocol checker logic monitoring the validity of bus  
3 transactions.
- 1 11. The apparatus of claim 10 wherein the protocol checker logic generates the device  
2 isolation signal responsive to a detected protocol violation.
- 1 12. The apparatus of claim 10 wherein the bus transactions are communicated on the bus  
2 in relation to clock cycles.
- 1 13. The apparatus of claim 12 wherein the protocol checker logic generates the device  
2 isolation signal during the same clock cycle as the detected protocol violation.
- 1 14. The apparatus of claim 1 wherein the bus status signal is a bus idle status signal.
- 1 15. The apparatus of claim 1 wherein the isolation control logic comprises a timer  
2 measuring elapsed time.
- 1 16. The apparatus of claim 15 wherein the timer measures elapsed time relative to a  
2 system event.
- 1 17. The apparatus of claim 16 wherein a timeout signal is generated in response to the  
2 elapsed time exceeding a predetermined threshold.
- 1 18. The apparatus of claim 17 wherein the isolation control logic transmits a bus reset  
2 signal responsive to receiving both the device isolation signal and the timeout signal  
3 from the timer.

1 19. In a system having a bus controlled by a bus controller and having at least one bus  
2 device in communication with the bus via an isolation switch, a method for isolating  
3 the bus device from the bus, the method comprising the steps:

4 (a) receiving a signal identifying a bus device to be isolated, the bus device  
5 performing a bus transaction;

6 (b) receiving a bus status signal; and

7 (c) transmitting an isolation switch control signal responsive to both the received  
8 device isolation signal and the received bus status signal.

1 20. The method of claim **19** further comprising the step of isolating the identified bus  
2 device from the bus responsive to the received bus device isolation signal.

1 21. The method of claim **19** further comprising the step of inhibiting bus access.

1 22. The method of claim **19** further comprising the steps of:

2 (a) receiving a timeout signal; and

3 (b) resetting the bus responsive to receiving both the timeout signal and the bus  
4 status signal indicating that the bus is not idle.

1 23. The method of claim **22** wherein step (b) comprises isolating the bus controller from  
2 the bus.

1 24. An apparatus for isolating a device from a bus without interrupting system operation,  
2 the apparatus comprising:

3 means for receiving a signal identifying a bus device to be isolated, the  
4 identified bus device performing a bus transaction;

5 means for receiving a bus status signal; and

6 means for transmitting an isolation switch control signal responsive to both  
7 the received bus device isolation signal and the received bus status signal.

1 25. The apparatus of claim 24 further comprising a means for isolating the identified bus  
2 device from the bus responsive to the received bus device isolation signal.

1 26. The apparatus of claim 25 wherein the bus device isolation means comprises an  
2 isolation switch.

1 27. The apparatus of claim 24 further comprising a means for inhibiting bus access.

1 28. The apparatus of claim 24 further comprising:

2 a timing means providing a timeout signal; and

3 a bus reset means resetting the bus responsive to receiving both the timeout  
4 signal and the bus status signal indicating that the bus is not idle.

1 29. The apparatus of claim 28 wherein the bus reset means isolates the bus controller  
2 from the bus.